

Docket No.: 3008-0016  
Client No.: PHCF-00189  
File No.: 521.41450X00

## REMARKS

Claims 1-4, 15-18, 21, 22, 24-31 are pending in this application. Claims 1-3 and 17 are amended herein.

Claim(s) 1-3 and 17 are independent.

Claims 1-3 are amended in a non-narrowing manner to recite Cu having 99.9999% or more purity in substitution for the previously recital of Cu having 1 ppm or less unavoidable impurity. Those skilled in the art would clearly understand that these different recitals are equivalent, and simply reflect different ways of saying the same thing. Claim 17 is amended solely to clarify that the recited elements are those used to form the wire.

Claims 1, 24 and 28 stand rejected under 35 USC §103 as unpatentable over JP 11-293365 (PTO-1449, abstract and Figure 1), JP 51-045528, JP 11-293431 or JP 2000-169918. Claims 1, 3, 17-18, 22, 24 and 28 stand rejected under 35 USC §103 as unpatentable over JP 05-051675. Claims 1-3, 17-18, 21-22, 24 and 28-31 stand rejected under 35 USC §103 as unpatentable over JP 57-070244 or DD 290501. Claims 4 and 15-16 stand rejected under 35 USC §103 as unpatentable over references in view of JP 61-113740 and further teachings of JP 02-204919. The rejections are respectfully traversed.

The Examiner relies generally on the abstracts of the nine (9) applied references without any identification of precisely where within the abstracts each of the limitations recited in the present claims is taught or suggested. Hence, the rejection is omnibus in nature, the Examiner has failed to provide the requisite support for the asserted rejections. Accordingly, the rejections cannot reasonably be understood.

More particularly, the Examiner contends that the recited alloys (with the exception of Cu having 99.9999% or more purity) are disclosed in the prior art.

However, contrary to this contention, the Examiner has yet to identify, with any specificity, where the applied prior art teaches or suggests alloys formed of elements either consisting only of or consisting essentially of:

- (i) high purity Cu and 1.0-5.0% AG having not less than 99.99% purity, as for example recited in claims 1, 18 and 28;
- (ii) high purity Cu, and 1.0-5.0% AG having not less than 99.99% purity, and 0.01-0.5% Mg having not less than 99.9% purity, as recited in claims 2, 21 and 29; and
- (iii) high purity Cu, and 1.0-5.0% AG having not less than 99.99% purity, and 0.01-0.3% In having not less than 99.99% purity, as recited in claims 3, 22 and 30.

For example, with regard to claims 1, 18 and 28:

- (i) the Examiner has failed to identify any teaching or suggestion in applied JP '365 of an alloy formed with high purity Cu and AG having not less than 99.99% purity, and the referenced abstract lacks any disclosure of these features;
- (ii) the Examiner has failed to identify any teaching or suggestion in applied JP '528 of an alloy formed with high purity Cu and AG having not less than 99.99% purity, and the referenced abstract lacks any disclosure of such features while disclosing that the alloy must include Mn;
- (iii) the Examiner has failed to identify any teaching or suggestion in applied JP '431 of an alloy formed of high purity Cu and AG having not less than 99.99% purity, and the referenced abstract lacks any disclosure of such features;

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- (iv) the Examiner has failed to identify any teaching or suggestion in applied JP '918 of an alloy formed of high purity Cu and AG having not less than 99.99% purity, and the referenced abstract lacks any disclosure of such features;
- (v) the Examiner has failed to identify any teaching or suggestion in applied JP '675 of an alloy formed of high purity Cu and AG having not less than 99.99% purity, and the referenced abstract lacks any disclosure of such features while disclosing that the alloy must include In;
- (vi) the Examiner has failed to identify any teaching or suggestion in applied JP '244 of an alloy formed of high purity Cu and AG having not less than 99.99% purity, and the referenced abstract lacks any disclosure of such features while disclosing that the alloy must include another element (e.g. Mn, In, Al, etc); and
- (vii) the Examiner has failed to identify any teaching or suggestion in applied DD '501 of an alloy formed of high purity Cu and AG having not less than 99.99% purity, and the referenced abstract lacks any disclosure of such features while disclosing that the alloy must include Ga, and is for a substrate (not a wire).

Thus, contrary to the Examiner's assertions, the applied prior art fails to teach or suggest an alloy formed of elements either consisting of or consisting essentially of high purity Cu and 1.0-5.0% AG having not less than 99.99% purity, as for example required by claims 1, 18 and 28, let alone such an alloy formed of Cu having 99.9999% or more purity.

With regard to claims 2, 21 and 29:

- (i) the Examiner has failed to identify any teaching or suggestion in applied JP '244 of an alloy formed of high purity Cu, and Ag having not less than 99.99% purity, and Mg

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having not less than 99.9% purity, and the referenced abstract lacks any disclosure of such features; and

(ii) the Examiner has failed to identify any teaching or suggestion in applied DD '501 of an alloy formed of high purity Cu, and Ag having not less than 99.99% purity, and Mg having not less than 99.9% purity, and the referenced abstract lacks any disclosure of such features while disclosing that the alloy must include Ga, only includes one of Ag and Mg, and is for a substrate (not a wire).

Thus, contrary to the Examiner's assertions, the applied prior art fails to teach or suggest an alloy formed of elements either consisting of or consisting essentially of high purity Cu, and 1.0-5.0% AG having not less than 99.99% purity, and 0.01-0.5% Mg having not less than 99.9% purity, as for example required by claims 2, 21 and 29, let along such an alloy formed of Cu having 99.9999% or more purity.

With regard to claims 3, 22 and 30:

(i) the Examiner has failed to identify any teaching or suggestion in applied JP '675 of an alloy formed of high purity Cu, and AG having not less than 99.99% purity, and In having not less than 99.99% purity, and the referenced abstract lacks any disclosure of such features while disclosing that the alloy must include Sn;

(ii) the Examiner has failed to identify any teaching or suggestion in applied JP '244 of an alloy formed of high purity Cu, and Ag having not less than 99.99% purity, and In having not less than 99.99% purity, and the referenced abstract lacks any disclosure of such features; and

(iii) the Examiner has failed to identify any teaching or suggestion in applied DD '501 of an alloy formed of high purity Cu and Ag having not less than 99.99% purity and In

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having not less than 99.9% purity, and the referenced abstract lacks any disclosure of such features while disclosing that the alloy must include Ga, only includes one of Ag and In, and is for a substrate (not a wire).

Thus, contrary to the Examiner's assertions, the applied prior art fails to teach or suggest an alloy formed of elements either consisting of or consisting essentially of high purity Cu, and 1.0-5.0% AG having not less than 99.99% purity, and 0.01-0.3% In having not less than 99.99% purity, as for example required by claims 3, 22 and 30, let along such an alloy formed of Cu having 99.9999% or more purity.

Accordingly, there are structural differences which distinguish the alloys of claims 1-3, 18, 21-22, and 28-30 over the applied prior art. Without structural obviousness, there is no case of *prima facie* obviousness and no need to address whether or not overlapping or similar purity ranges exist in the prior art. Indeed, in the last Office Action, the Examiner appears to acknowledge that claimed range of copper purity does not overlap with the prior art (page 3, lines 2-6, and page 4, line 6, of Official Action).

Furthermore, even if there were a reason to consider possible overlap or closeness in ranges, the Examiner has failed to apply art that discloses purity parameters. Hence, there are no conventional ranges disclosed in the applied prior art to compare to those claimed in order to determine if overlapping ranges or even non-overlapping ranges which "are close enough that one [of] ordinary skill in the art would have expected them to have the same properties" are in fact present.

Further still, the Examiner has failed to apply any prior art disclosing or suggesting that the purity of the Cu used to form an alloy wire is a recognized result-effective variable. Since the applied prior art did not recognize that the amount of drawn

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wire obtainable could be increased by increasing the Cu purity used to form an alloy wire, the optimizing of the Cu purity is was not recognized in the art as a variable which achieves a recognized result. Hence, variation in the CU purity cannot be considered routine experimentation. Therefore, it was not even obvious to vary the purity of the Cu used to form an alloy wire to improve on the amount of drawn wire.

It is respectfully submitted that what the Examiner argues is obvious, would appear to be based on either improper hindsight (in which case the rejection should be withdrawn) or the Examiner's personal knowledge (in which case the Examiner is requested to issue an affidavit in support of the rejection in accordance with 37 CFR §1.104(d)(2)), since there is no teaching or suggestion of the claimed alloys (even ignoring the limitation that the Cu have 99.9999% or more purity) or recognized result-effective variable within the applied prior art.

JP '740 (which is not applied against claims 1, 2, 3, 18, 21, 22, 28, 29 and 30) discloses that the formed alloy wire has a Cu purity of 99.999% and must include Ni or Co, and Zr or Nb. Hence, the relevance of the Cu purity content of the alloy wire of JP '740 is not understood.

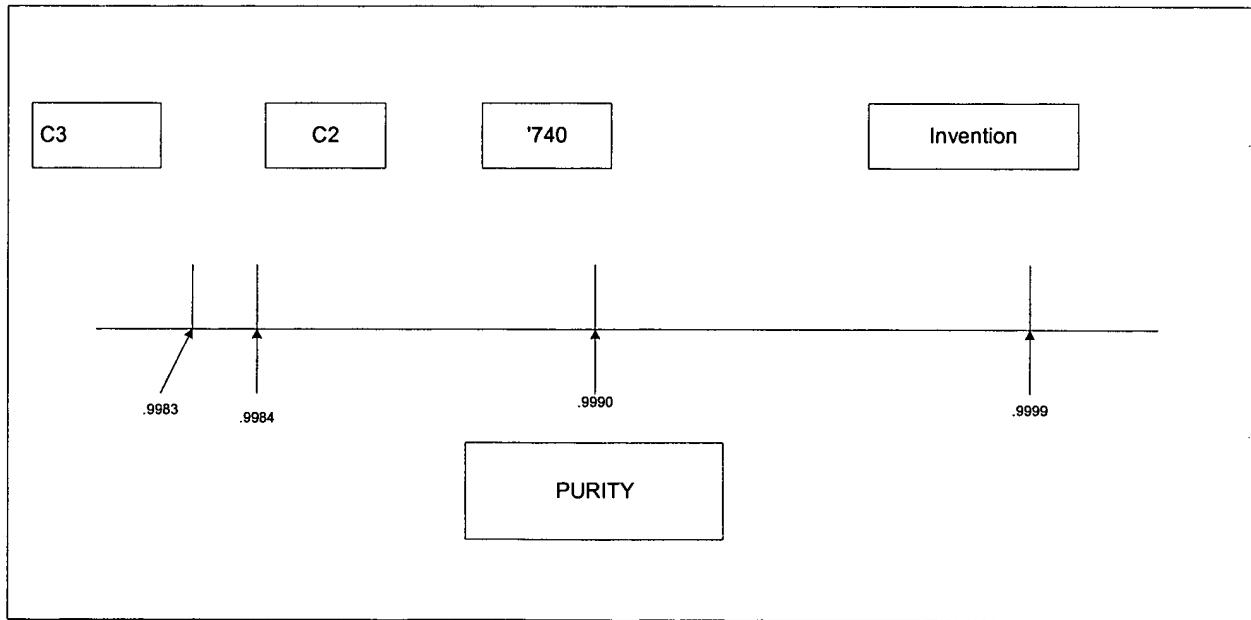
As to results due to the particular Cu purity range being claimed (i.e. 99.9999% and greater Cu purity), the Examiner's attention is directed to Table 1 of the originally filed specification. As documented therein, with a copper impurity range of 1 mass ppm or less (i.e. a Cu purity of 99.9999% or more), the amount of drawn wire increases a minimum or approximately 1.9 times from that obtainable using the alloys of comparative Examples 2 and 3.

Specifically, using an inventive alloy corresponding to the alloys of comparative

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Examples 1 and 2, but with 99.9999% or more CU purity, the amount of drawn wire is 2.22 and 2.50, respectively, while the amount of drawn wire using the corresponding alloys of comparative Examples 2 and 3, which are formed with Cu having less than 99.9999% purity, is 1.18 and 1.25, respectively. Hence, the increase in the amount of drawn wire is 1.88 (i.e. 2.22/1.18) and 2.00 (i.e. 2.50/1.25). The alloys in comparative examples 2 and 3 have copper purities of 99.9984% (i.e. 100-0.0016) and 99.983% (i.e. 100-0.0017), respectively by mass. Thus, the claimed invention provides a significant improvement.

The following depicts a comparison of the claimed invention and the alloys of comparative Examples 2 and 3, as well as an alloy having the purity of JP '740 (i.e. 5N purity copper (99.999% purity), as acknowledged by the Examiner on page 4, line 7, of the Official Action, and hence an impurity of 0.0010% by mass).



C2 and C3 are comparative Examples 2 and 3, respectively.

As seen from the above, the Cu purity level of JP '740 is rather close to that of alloys used in C2 and C3. It is perhaps also worthwhile to note that, JP '740 does not

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disclose or otherwise suggest that lowering the purity of the Cu used to form the alloy wire could or would increase the obtainable amount of drawn wire. Indeed, the properties of the alloy that are disclosed to be of concern in JP '740 are limited to (a) tensile strength, (b) temp. strength, (c) capacity to be heat welded and supersonically bonded, (d) obtaining a nearly true spherical and consistent ball shape, and (e) bond strength after bonding, as well as improving heat resistance and corrosion while maintaining the electrical conductivity (see Abstract of '740).

Thus, like the other applied art, JP '740 provides no motivation or suggestion to increase the purity of the Cu used to form the alloy wire to increase the amount of drawn wire, and there is nothing in JP '740 to suggest that the purity of the Cu used to form the alloy is a result-effective variable. In fact, JP '740 (like the other applied art) lacks any recognition of the effect of varying the purity on the obtainable amount of drawn wire.

The Examiner asserts that "the claimed purity of each element is prior to forming the claimed wire and claimed purity of each elemental element is not existed in the final product" (see page 5, lines 3-4, of Official Action).

However, the purity, especially of the copper, prior to forming the wire is what is critical to the present invention. The originally filed specification states that "the other route is inclusions contained in copper as a material or additive elements ..... On the other hand, improving the quality of the base material is necessary for reducing the amount of the latter type of foreign materials". That is, the use of high purity copper in the recited range as an elemental material in forming the alloy wire improves the properties of wire significantly in comparison to the applied art alloys. The improved properties allow an

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increase in the obtainable amount of drawn wire. The purity of the copper after the wire has been formed is irrelevant. Hence, the relevance of the Examiner's statement that "claimed purity of each elemental element is not existed in the final product", is not understood.

Claims 4, 15-17 and 24-27 are allowable for reasons which should be clear from the above, as well as on other grounds.

In view of the foregoing, it is respectfully submitted that the application is in condition for allowance and an early indication of the same is courteously solicited. The Examiner is respectfully requested to contact the undersigned by telephone at the below listed local telephone number, in order to expedite resolution of any remaining issues and further to expedite passage of the application to issue, if any further comments, questions or suggestions arise in connection with the application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 01-2135 and please credit any excess fees to such deposit account.

Respectfully submitted,  
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